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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/583,219

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Jean Armioli

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EXAMINER

TIETJEN, MARINA ANNETTE

ART UNIT

PAPER NUMBER

3753

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/583,219	<b>Applicant(s)</b> ARMIROLI ET AL.	
	<b>Examiner</b> MARINA TIETJEN	<b>Art Unit</b> 3753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 March 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 17-36 is/are pending in the application.
- 4a) Of the above claim(s) 21-23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 17-20 and 24-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 June 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>06/16/2006</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant's election of Species A in the reply filed on 3/20/2009 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

2. Claims 21-23 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to nonelected Species B and C, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 03/20/2009.

### *Drawings*

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the valve member abutment (claim 25), the concavity of the piezoelectric portion (claim 31), and the plurality of apertures (claim 32) **must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.**

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet,

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and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. The drawings are objected to because elements 12, 13, and 16 are each referred to as "part" in the specification. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required

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corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claim 32 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

7. Claim 32 recites the limitation "a plurality of apertures formed in the piezoelectric portion". Given that the "piezoelectric portion" is a disc ring, as claimed in claim 17, the specification or drawings do not show or describe more than a single aperture in the center of the disc ring for attachment to the first needle (6). For the purpose of examination, it will be assumed the limitation reads "an aperture formed in the piezoelectric portion".

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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9. Claims 29 and 31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

10. Claim 29 recites the limitation "the low pressure chamber" in line 2. There is insufficient antecedent basis for this limitation in the claim.

11. Claim 31 recites the limitation "the first needle portion" in line 2. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

13. Claims 17 and 31 are rejected, as far as they are definite, under 35 U.S.C. 102(a) and 102 (e) as being anticipated by Cotton, III et al. (U.S. Pub. No. 2003/0226988).

Cotton discloses a valve (fig. 7a) comprising:

a valve body (334, 316) defining an inlet (336), an outlet (340), and a seat (350),

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a first valve member (330) moveable between a first valve member closed position and a first valve member open position, wherein at least a portion (348) of the first valve member (330) is in contact with the seat (350) in the first valve member closed position, and the at least a portion (348) of the first valve member (330) is spaced a predetermined distance from the seat (350) when the first valve member (330) is in the first valve member open position; and

a piezoelectric portion (312) for receiving a voltage, wherein at least a portion of the piezoelectric portion (312) is moveable relative to the valve body, and wherein the piezoelectric portion is a ring disc; and

wherein the piezoelectric portion (312) is configured such that it has a concavity directed towards a first needle portion (344) when the voltage is about zero.

### ***Claim Rejections - 35 USC § 103***

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

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not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

16. Claims 17-20, 24-36 are rejected, as far as they are definite, under 35 U.S.C. 103(a) as being unpatentable over Tsutsui et al. (U.S. Pat. No. 4,989,277) in view of Meckstroth (U.S. Pat. No. 4,561,627).

Tsutsui discloses a valve (fig. 5) comprising:

a valve body (42, 12) defining an inlet (area outside of seat 34), an outlet (inside of seat 34), and a seat (34),

a first valve member (33a) moveable between a first valve member closed position and a first valve member open position, wherein at least a portion of the first valve member (33a) is in contact with the seat (34) in the first valve member closed position, and the at least a portion of the first valve member (33a) is spaced a predetermined distance from the seat (34) when the first valve member (33a) is in the first valve member open position;

a piezoelectric portion (45a) for receiving a voltage, wherein at least a portion of the piezoelectric portion (45a) is moveable relative to the valve body;

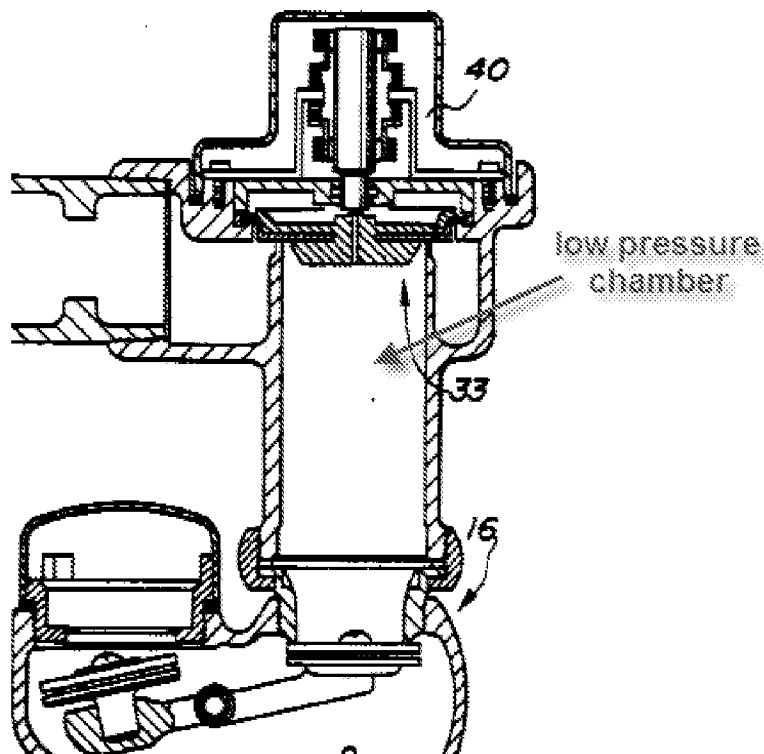
wherein at least a portion of the first valve member (33a) is moveable generally parallel to an axis of the piezoelectric portion (45a);

further comprising a first needle (44) coupled to the piezoelectric portion (45a), wherein the valve body (42, 12) is further defined by a first port (opening on top surface of valve member 33a which the first needle 44 sits on and blocks flow through), a low



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pressure chamber (see labeled fig. 4 below), and a high pressure chamber (between the top surface of valve member 33a and member 43); the first needle portion (44) is moveable between a first needle open position and a first needle closed position; at least a portion of the first needle portion (44) is in contact with at least a portion of the first port (opening in top surface of valve member 33a) when the first needle (44) is in the first needle closed position, thereby defining a first boundary between the low pressure chamber and the high pressure chamber; and wherein the first valve member (33a), in the first valve member closed position, defines a second boundary between the low pressure chamber and the high pressure chamber;

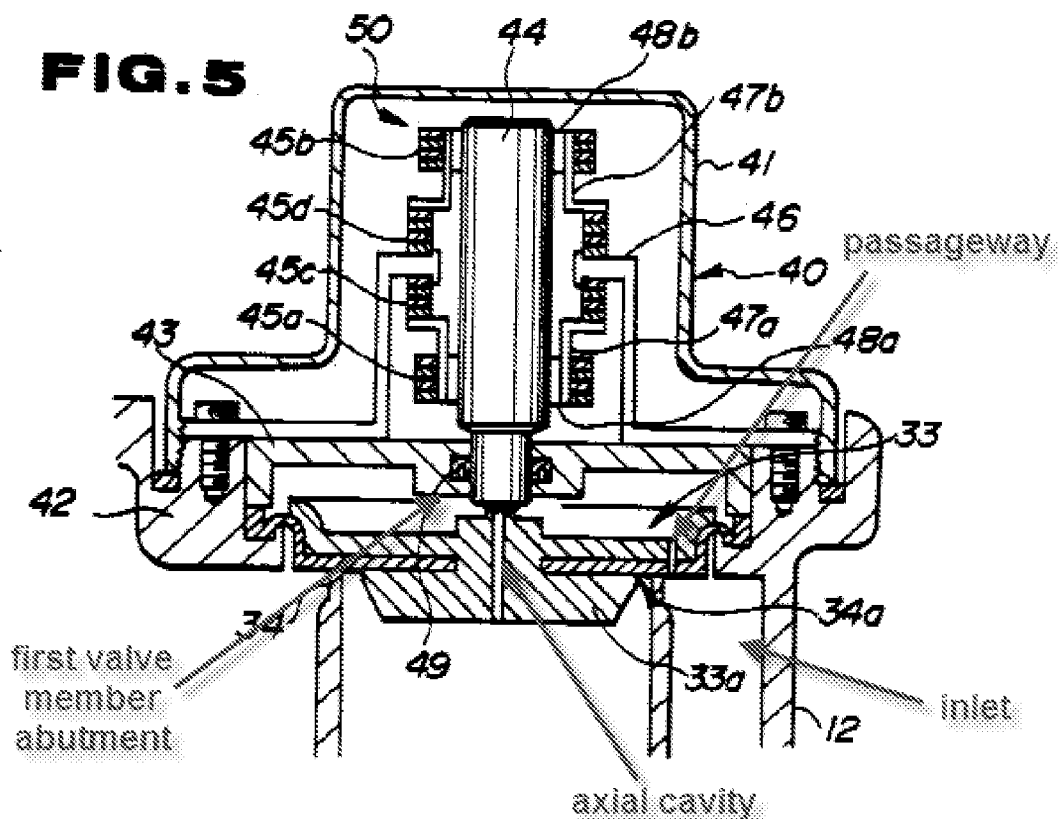
**FIG. 4**

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wherein the first needle (44) is coupled generally coaxially to a central portion of the piezoelectric portion (45a);

wherein at least a portion (top surface) of the first valve member (33a) defines a portion of the high pressure chamber;

wherein the valve body member (42, 12) defines a first valve member abutment (see labeled fig. 5 below), and wherein at least a portion of the first valve member (33a) contacts at least a portion of the first valve member abutment (labeled fig. 5) when the first valve member is in the first valve member open position;



wherein the first valve member (33a) is defined by an axial cavity (see labeled fig. 5 above) formed therein;

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wherein the first valve member (33a) is further defined by a passageway (see labeled fig. 5 above) connecting the cavity (labeled fig. 5) in fluid communication with the inlet (see labeled fig. 5 above);

wherein the first valve member (33a) is coupled to the piezoelectric portion (45a) for moving the first valve member (33a) between the first valve member open position and the first valve member closed position;

wherein the first valve member (33a) is in the first valve member closed position when the voltage is about zero (col. 5, lines 65-67);

further comprising an aperture (central opening in which 44 fits) formed in the piezoelectric portion (45a).

However, Tsutsui does not disclose wherein the piezoelectric portion is a disc ring having first surface having a concavity directed towards the first needle portion when the voltage is about zero; wherein a voltage is applied to the piezoelectric portion to deform the at least a portion of the first surface as the first valve member moves relative to the valve body between the first valve member closed position and the first valve member open position as a result of deformation of the piezoelectric portion; and wherein the piezoelectric portion is positioned in the low pressure chamber.

Meckstroth teaches a piezoelectric portion (similar to 70, fig. 3; col. 6, lines 3-7) is a disc ring having first surface having a concavity directed towards a port opening (60) when the voltage is about zero; wherein a voltage is applied to the piezoelectric portion to deform the first surface as a first valve member (46) moves relative to a valve body (16) between a first valve member closed position and a first valve member open

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position as a result of deformation of the piezoelectric portion (70); and wherein the piezoelectric portion (70) is positioned in the low pressure chamber (through connections 66, 68) for the purpose of providing an actuator which uses little power, has very fast response times, has proportionally controllable operation, and greatly reduces the size of the stacks required in Tsutsui's actuator; and wherein the piezoelectric portion being positioned in the low pressure chamber allows the pilot port to efficiently vent as it is always open to the low pressure within the outlet.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tsutsui's valve such that the piezoelectric portion is a disc ring having first surface having a concavity directed towards the first needle portion when the voltage is about zero; wherein a voltage is applied to the piezoelectric portion to deform the at least a portion of the first surface as the first valve member moves relative to the valve body between the first valve member closed position and the first valve member open position as a result of deformation of the piezoelectric portion; and wherein the piezoelectric portion is positioned in the low pressure chamber, as taught by Meckstroth, for the purpose of providing an actuator which uses little power, has very fast response times, has proportionally controllable operation, and greatly reduces the size of the stacks required in Tsutsui's actuator; and wherein the piezoelectric portion being positioned in the low pressure chamber allows the pilot port to efficiently vent as it is always open to the low pressure within the outlet.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARINA TIETJEN whose telephone number is (571) 270-5422. The examiner can normally be reached on Mon-Thurs, 9:30AM-5:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, ROBIN EVANS can be reached on (571) 272-4777. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. T./  
Examiner, Art Unit 3753

/John K. Fristoe Jr./  
Primary Examiner, Art Unit 3753